

## Claims

- 1 A method of determining activity and aging behavior of a catalyst by producing  
a stream of hot combustion offgases having a defined pollutant composition by  
mixing a first substream of hot combustion offgases with a second substream of  
5 hot combustion offgases, passing the combustion offgases over the catalyst to be  
tested and determining the pollutant conversions effected by the catalyst.
2. The method as claimed in claim 1, wherein the first substream of hot combustion  
offgases makes up from 60 to 95% of the total mass flow of the two substreams.
3. The method as claimed in claim 2, wherein the first substream of hot combustion  
10 offgases is produced by burning a motor fuel in a first stream of combustion air  
and the second substream of hot combustion offgases is produced by burning  
gaseous hydrocarbons in a second stream of combustion air.
4. The method as claimed in claim 3, wherein the first substream of hot combustion  
offgases has an air ratio  $\lambda$  of greater than 1.
- 15 5. The method as claimed in claim 4, wherein ammonia or aqueous ammonia is  
introduced into the first and/or second stream of combustion air in order to  
increase the nitrogen oxide concentration in the combustion offgases.
6. The method as claimed in claim 4, wherein poisoning elements in the form of  
precursor compounds are added to the motor fuel.
- 20 7. The method as claimed in claim 3, wherein the air ratio  $\lambda$  of the second  
substream of combustion offgases is set to a value in the range from 0.5 to 3.
8. The method as claimed in claim 7, wherein water is introduced into the second  
stream of combustion air in order to avoid soot formation in the case of  
extremely rich operating conditions.
- 25 9. The method as claimed in claim 7, wherein hydrocarbons which are difficult to  
oxidize are added to the gaseous hydrocarbons.
10. The method as claimed in claim 3, wherein the temperature of the first  
substream of combustion offgases is reduced to a value in the range from 800 to  
200°C before it is mixed with the second substream of combustion offgases.

11. The method as claimed in claim 10, wherein hydrocarbons, oil additives or further gaseous or vaporizable components are added to the mixed combustion offgases before they are brought into contact with the catalyst.
- 5 12. The method as claimed in claim 11, wherein the temperature of the mixed combustion offgases is set to a defined value before contact with the catalyst.
- 10 13. An apparatus (10) for determining the activity and the aging behavior of a catalyst (20), which comprises a first burner (30) having an offgas line (40) in which the catalyst is located, wherein the apparatus further comprises a second burner (50) having an offgas line (60) which opens into the offgas line (40) of the first burner (30) upstream of the catalyst (20).
14. An apparatus as claimed in claim 13, wherein the first burner (30) is a liquid fuel burner which is supplied via the feed line (32) with a motor fuel as fuel and via the feed line (31) with a first stream of combustion air.
- 15 15. An apparatus as claimed in claim 14, wherein the second burner (50) is a gas burner which is supplied via the feed line (52) with a gaseous fuel and via the feed line (51) with a second stream of combustion air.
16. An apparatus as claimed in claim 15, wherein both offgas lines contain lambda probes (41) and (61).
- 20 17. An apparatus as claimed in claim 16, wherein a first heat exchanger (42) and a first temperature sensor (43) are provided in the offgas line of the first burner upstream of the junction with the offgas line of the second burner.
18. An apparatus as claimed in claim 17, wherein a second heat exchanger (44) and a second temperature sensor (45) are located in the offgas line of the first burner downstream of the junction with the offgas line of the second burner.
- 25 19. An apparatus for determining activity and aging behavior of a catalyst, in particular for implementing a method as claimed in any of claims 1 to 12, comprising:  
a facility for producing a stream of hot combustion offgases having a defined pollutant composition, where the production facility has a first facility for  
30 providing a first substream of hot combustion offgases, a second facility for providing a second substream of hot combustion offgases and a facility for

mixing the first substream and the second substream,  
a facility for passing the combustion offgases over the catalyst to be tested and  
a facility for determining the pollutant conversion effected by the catalyst.